I. Fill in the Blank (30 pts)

1. In order to convert a double to an int, we must use ______________________.

2. The parameters in the call to a method are called the ______________________ parameters.

3. An int is a ______________________ data type because the first bit indicates something special about what is stored in the int.

4. ______________________ involves having more than one method in a class definition with the same name.

5. The ______________________ of a variable is the portion of code in which it is accessible.

6. The ______________________ of a method is a combination of its name and parameter list in Java.

7. A Java identifier can contain letters, digits, $, and _, but cannot start with a ______________________.

8. ______________________ is used to encode characters in Java.

9. If the two operands in an operation are ints, the type of the result is ______________________.

10. If we create an array of ints, the initial value of each int is ______________________.

11. Java uses pass by ______________________ to send parameters to a method.

12. A ______________________ loop is one that is inside another loop.

13. The compiler will ignore any part of a line of code after ______________________.

14. ______________________ bits are used to store an int in Java.

15. We use the operator ______________________ to test for equality between two primitive types.
16. If a ____________________ statement is encountered in a loop, then the remainder of that iteration is skipped.

17. ____________________ are the components of a computer that we can physically touch.

18. ____________________ is automatically imported into every program in Java.

19. The three types of errors we encounter in programming are ____________________, run-time, and logic.

20. An array is somewhat an example of an ____________________ object because its size can’t be changed after it is created although its contents can be changed.

21. If a variable is declared ____________________, we cannot assign a value to it more than once.

22. If a method does not return a value, we should make its return type ____________________.

23. A ____________________ in Java is a collection of related classes.

24. The type of the condition in an if or while statement must be ____________________.

25. Structured programming tries to avoid the use of the ____________________ statement.

26. We obtain the size of an array by accessing the field ____________________ associated with the array.

27. The ____________________ search technique involves examining the midpoint of a sorted array to locate an element.

28. True/False ____________________ If the return type of a method is double[], we can return an int[].

29. The index of the first element in an array is ____________________.

30. The parameters in the declaration of a method are called ____________________ parameters.
II. Matching (10 pts)

31. != ________
   A. An environment variable that contains a list of directories that will be searched for Java class files

32. pre-test loop ________
   B. array.size-1

33. import ________
   C. Illustrated by DayOfWeek

34. The last valid position ________ in an array
   D. Makes several passes through an array each time holding an element in place and comparing it with each remaining element

35. Scanner ________
   E. A loop in which a condition is checked after the body of the loop is executed

36. Reassigns an already declared ________ variable to point to a new array
   F. A statement that is used to declare that our Java program is part of another class

37. CamelCase ________
   G. array.length-1

38. CLASSPATH ________
   H. array.length

39. Bubble Sort ________
   I. Makes several passes through an array each time comparing each pair of adjacent elements

40. A valid declaration of a method ________ of variable arity
   J. A device Java uses to interpret handwriting

K. array = {1,2,3,4,5};

L. The class we use to read input at the keyboard

M. The operator used to emphasize assignment

N. A loop in which a condition is checked before the body of the loop is executed

O. public int sum(int... array,int num)

P. The operator used to test for inequality

Q. public int sum(int... array)

R. The statement we use to include another Java class in our program

S. array = new int[[]]{{1,2,3,4,5}};

T. Illustrated by dayofweek

U. An environment variable that contains a list of directories that will be searched for executable programs
III. Short Answer (20 pts)

41. (3 pts) What is the binary equivalent of the decimal number 51?

42. (3 pts) If we use four bits to store a number, what is the representation of -5?

43. (3 pts) Is there a difference in what the following loops print? If so, why is there a difference?

   **Loop 1**
   ```java
   int counter = 0;
   while (counter++ < 10)
       System.out.println(counter);
   ```

   **Loop 2**
   ```java
   int counter = 0;
   while (++counter < 10)
       System.out.println(counter);
   ```

44. (3 pts) Recall that expressions are evaluated left to right, what is the value of the following expression?

   \[\frac{4}{5} \times 15 \times 530 \times 837 / 9240 \times 1500 - 3 \times 5 + 2 / 15 \times 4\]
45. (3 pts) What is the output of the following? Explain the output.

System.out.println(1 + 2 + “Hello” + 3 + 4);

46. (3 pts) What is the value of found after the following statement executes?

boolean found = (15 < 30/2) ? (5*4 % 3 == 0) : (6*5-2 > 5);

47. (2 pts) What line of code will produce a random integer between 100 and 200 with 200 not included?
IV. Discussion (10 pts)

48. (5 pts) What are the steps in the Polya Problem Solving Methodology?

49. (5 pts) Suppose we have a method which accepts an array as parameter. What can we do in the method that would prevent us from accessing the original array referred to by the actual parameter in the method call?
51. (5 pts) Will the following produce a compile-time error? Why or why not?

```java
public static boolean greaterThan400(int number) {
    if (number > 400 || number > 500)
        return(true);
    else if (number < 400 || number < 340)
        return(true);
}
```

52. (5 pts) Fill in the missing pieces of this code so that the method will return a reference to a new int array containing the contents of the original array together with the number sent in as parameter.

```java
public static int[] add(int[] array, int number) {
    int[] temp = new int[array.length];
    System.arraycopy(array,0,temp,0,______________________);
    temp[______________________] = number;
    return(______________________);
}
```

53. (5 pts) What is produced by the following code? Explain the output.

```java
public class Question53 {
    public static void place(int[] array, int index, int number) {
        array = new int[array.length];
        array[index] = number;
    }
    public static void main(String[] args) {
        int[] array = {1,2,3,4,5};
        place(array,0,4);
        place(array,1,5);
        place(array,2,3);
        place(array,3,1);
        place(array,4,2);
        for (int number : array)
            System.out.println(number);
    }
}
```
54. (7.5 pts) Suppose we want to write a method that will accept any number of int parameters and return the product of the parameters. Show the declaration and body of the method.

55. (7.5 pts) Suppose we have a method that accepts an int[] as parameter. Show the contents of the method so that the contents of the array will be reversed. That is, if 1,2,3,4,5 is the array sent to the method, after the method executes, the contents will be 5,4,3,2,1.